

April 18, 2016

**STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN**

CONFERENCE REPORT

PROJECT: WALPOLE-CHARLESTOWN 14747

Reconstruct NH Route 12 from Main Street in North Walpole north,
approximately 3 miles, to NH Route 12A in South Charlestown

DATE OF CONFERENCE: April 12, 2016

LOCATION OF CONFERENCE: Charlestown Community Building

ATTENDED BY:

See attached sign in sheet

SUBJECT: Project Advisory Committee Meeting

NOTES ON CONFERENCE:

This Project Advisory Committee Meeting was held to provide an update on the project status. After introductions, D. Lyford started the meeting with a brief overview of the cost implications for the project (\$16.9 million programed, actual cost \$33 million). Then P. Salo gave an overview of the challenges associated with the design of the 3-2-3 concept. Below is a summary of the points discussed:

1. Scope
 - A. Improve NH Route 12 (approx. 3 miles) from North Walpole to just north of the NH 12A overpass in Charlestown
2. Existing conditions
 - A. The existing roadway is narrow (22'-24' wide) with no paved shoulders.
 - B. NH Route 12 needs full box reconstruction, guardrail and drainage upgrades. Riverbank slope stability issues are present in the southern segment.
3. Current design
 - A. The presentation plan shows the Public Hearing alternative (3-2-3) for the roadway and mainline track alignments.
 - i. 32-wide (11/5) typical section (5'-wide paved shoulders)

- ii. Realign NH Route 12 outside of the potential slope failure plane in the southerly segment. The design includes a 50'-60' easterly shift of the roadway to accommodate the riverbank stability issues. The design relocates the New England Central Railroad (NECR) to the east of the relocated roadway, accordingly.
 - iii. Westerly roadway shift in the middle segment
 - a. No RR impacts
 - iv. Easterly (more modest) shift in the northern segment for roadway and RR
- 4. Project is broken out into two construction contracts
 - A. 14747A – Railroad relocation (Advertise 08/23/16)
 - i. \$11.1M Programmed construction estimate
 - B. 14747 – Roadway reconstruction (Advertise 10/30/2018)
 - ii. \$5.8 M Programmed construction estimate
- 5. Railroad Relocation Contract (14747A)
 - A. Issues
 - i. Difficulties coordinating with the New England Central Railroad (NECR)
 - ii. Significant increase in estimated cost for rock excavation
 - a. Blasting next to an active railroad
 - 6 trains/day (includes Amtrak and freight)
 - Leaves 2 4-hour windows for blasting, clean-up, track inspection and repairs, if necessary
 - Materials & Research recommended a minimum unit cost of \$100/CY (an increase from \$12/CY). At 60,000 CY, total rock excavation costs and ancillary items increase from approximately \$1 million to approximately \$8 million
 - iii. The existing RR ballast is considered as hazardous material requiring proper disposal
 - b. Current estimate = \$600,000 (items required for on-site disposal)
 - Not included in the Programmed Estimate
 - c. Estimate could increase to over \$2M for off-site disposal
 - iv. Other unit price increases due to limited working space for construction activities
 - v. Estimated construction cost increase from \$11.1M to \$26M
- 6. Roadway Relocation Contract (14747)
 - A. Issues

- i. Overall increased unit prices due to limited working space for construction activities
 - ii. Estimated construction cost increase from \$5.8 million to \$7 million.
- 7. Total estimated construction project cost increase (14747A and 14747) from \$16.9 million to \$33 million.
 - A. The Department's program cannot support a \$16 million construction cost increase.
- 8. As a result, Design began to investigate/develop design alternatives that did not impact the railroad (tracks).
 - A. The only feasible alternative, originally discussed during the CSS process, was Alternative 2 – Westerly alignment shift away from the RR
 - i. Roadway alignment is shifted 4'-12' west of the existing roadway
 - a. Offset is dependent on maintaining the existing RR drainage patterns and constructability issues (i.e. maintenance of traffic)
 - One lane alternating two-way traffic
 - b. NHDOT evaluated two alternatives for slope treatments on the River side of the newly proposed roadway design:
 - 1.5 :1 rock lined slopes with surface vegetation (humus and landscaping)
 - Vegetate 2' above OHW
 - Fill beyond OHW (25' average (southern segment), 12' average (northern segment))
 - Cast-in-Place concrete retaining walls
 - Southern segment = 3,000 lf
 - Northern segment = 1,700 lf
 - Variable height (over 20' in some locations)
 - The Department recommends the rock lined slopes with surface vegetation design
 - Shorter construction duration
 - Maintenance-free
 - More aesthetically pleasing from the Connecticut River
 - Provides habitat for wildlife
 - Less costly (approx. \$11 million less than the wall option)
 - NHDOT met with the Resource Agencies in January 2016 (general status update) and March 2016 to present the recommended design

- The Agencies did not oppose the recommendation for the armored slopes with surface vegetation noting that the Department had developed, and carefully considered, alternatives to the current design.

B. The revised project can advertise for construction bids in October 2017

- i. This will allow for roadway construction to start one year earlier than the current design roadway contract and likely within the current programmed construction budget.
- ii. Eliminates the need for two construction contracts and 4 consecutive years of construction activity along this segment of NH Route 12.

Next, S. Fifield gave a presentation (attached with this report) that summarized the investigation performed by the Department to provide an alternative design that did not impact the railroad. Below is a summary of the points discussed:

- S. Francis asked if the Department knew the actual depth of the river beneath the waterline. She noted that the river located adjacent to the southern segment of the project is problematic, due to the depth of the water and the fast current. She cautioned that the elevation of the Connecticut River fluctuates often, due to the releases at the Bellows Falls Dam, and that that fluctuation should be considered in the design. D. Lyford noted that the Department has surveyed the river bottom within the design limits. S. Fifield noted that river characteristics (such as the water velocity and depth fluctuations) will be factored into the design of the armored slopes. S. Fifield also noted that (on average) the fill slope extends horizontally approximately 25 feet beneath the waterline. However, there is a section of slope that does extend horizontally approximately 50 feet beneath the waterline, which is indicative of the location of the deep area that S. Francis mentioned as being problematic.
- J. Bruno noted that stone slopes are the best long term solution. He also noted that the 3-2-3 alternative design did not address slope stability. He did, however, caution that it may be difficult to convince the ACOE and the EPA that the armored slopes are the most reasonable and feasible design. He also noted that retaining wall repairs would impact the traveling public.
- J. McClammer noted that riverbank stability research suggests that armored (stone) slopes are the most stable of the riverbank slope systems, and that no research exists to support the theory that armored slopes erode riverbank slopes downstream. He recommended that the Department look into the research completed by John Field, PhD. (*John Field is a world renowned Fluvial Geomorphologist who has completed many river studies in NH, including the upper Connecticut River.*) He asked if the Department had good river survey data and noted that TransCanada has recent Lidar data of the Connecticut River, due to the recertification of the Bellows Falls Dam. Mr. McClammer suggested that the Department may be able to request river study information and data associated with the dam recertification from TransCanada. He asked if the environmental mitigation for the project will be payment into the Aquatic Resource Mitigation (ARM) fund. D. Lyford answered yes. J. Evans explained some of the parameters associated

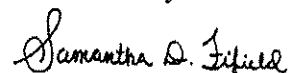
with the ARM fund. He noted that DES prefers that Towns have the first chance to use mitigation money for water quality improvements (within their local watershed as part of the project) rather than receive the entire ARM Fund payment from a project. He requested that the Towns submit potential projects that could become part of the 14747 mitigation package. D. Lyford requested that the Towns submit this information through him. *In an email (dated 4-13-16), Nate Miller asked the Department to determine if the Towns could receive funding from the project to complete a culvert inventory for the Towns of Walpole and Charlestown as one of the mitigation projects.*

- J. Bruno asked about the proposed roadway structural box depth, and he expressed concern with the current roadway box design. P. Salo noted that the currently proposed roadway box contains 6" of asphalt, 12" of crushed stone (fine gradation), 12" of crushed stone (coarse gradation) and 12" of sand. S. Fifield noted that the design of the roadway structural box will be reevaluated with the revised design of the roadway.
- J. McClammer asked if archaeological surveys have been completed for the new design and if the western shift of the roadway will impact archaeological site 10. S. Fifield and D. Lyford noted that, in the original design, the middle section was shifted westerly to prevent impacts to Fall Mountain. The alternative 3-2-3 design did not impact the railroad tracks in the middle section to prevent an 80 foot cut (vertically) into Fall Mountain. S. Fifield noted that the new designed "middle section" mimics closely what had been designed previously and that, despite the westerly shift of the roadway, archaeological site 10 will not be impacted. J. Evans noted that the project's NEPA document requires reevaluation and that all of cultural and natural resource surveys and investigations will have to be completed once again. J. McClammer noted that the TransCanada Bellows Falls Dam recertification study will be available to the public in July, and that the Department may be able to use the information and data gathered for the study for this project.
- S. Francis commented that, given the design, construction and long term maintenance issues pertaining to the retaining walls, they should no longer be considered as a viable option for design. She reiterated that the water level fluctuations in the river should be carefully considered when the armored slopes are designed. She also stated that it would be very difficult to argue against the armored slopes given that the design will incorporate landscaping to nearly the edge of the waterline.
- J. McClammer asked if the filter fabric, which is typically used under stone, can be eliminated along part of the slope (say 10 feet above the water line in the southern segment) to promote root growth. S. Fifield noted that the Department could investigate this during the design process and research optimal methods of reestablishing vegetation on the proposed armored slopes.
- In the spirit of the CSS process, N. Miller requested that everyone around the table share their thoughts on the proposed design. They are summarized below:

1. Mary Holmes agreed with the proposed westerly shift of the roadway with the use of the armored slopes with surface vegetation to stabilize the riverbank slope.
2. Richard Holmes also agreed with the proposed design. However, he asked the Department to consider the potential for erosion downstream of the rock slope design.
3. Steve Neill also agreed with the proposed design. However, he asked if the design of the northbound pulloff area could be maximized to accommodate trucks.
4. Dave Edkins also agreed with the proposed design.
5. Sharron Francis also agreed with the proposed design. However, she requested that the Department evaluate the history of the Connecticut River located at the southern segment (such as prior riverbank erosion, ice jams and water elevation fluctuations) during the design process. She also cautioned the Department to design the slopes to avoid adversely impacting riverbank properties downstream of the project limits.
6. Jim McClammer also agreed with the proposed design. He cautioned that the biggest problem is riverbank erosion. He encouraged the Department to use John Field's research and reiterated that rip rap stone slopes are the most stable configuration for the riverbank slopes in this area. He would like for ARM Fund money to stay local. J. Evans again requested mitigation opportunities from the Towns. He noted that ARM funds are available based on watersheds, and that approval to use the funds for local projects has to be approved by DES. He asked the Towns to look for undersized culverts and for potential projects that would allow for habitat connectivity. Mr. McClammer requested that the new design incorporate additional water quality Best Management Practices (BMPs). S. Fifield mentioned that the new design would incorporate the originally proposed treatment swale, located just south of the NH Route 12A Bridge. However, she stated that there is a lack of physical space through the remainder of the project to install a formalized BMP, and that the characteristics of the existing soils will not support the installation of formalized BMPs (such as an infiltration basin). Mr. McClammer requested that the Department investigate an additional widening of the riverbank slope to allow for the installation of water quality BMPs. Mr. McClammer reiterated that the Department may be able to take advantage of the TransCanada Bellow Falls Dam recertification study for the natural and cultural resource investigations needed for the reevaluation of NEPA on this project.
7. Charlie St. Pierre also agreed with the proposed design.
8. John Bruno also agreed with the proposed design. He noted that this design alternative was his preferred alternative at the beginning of the design process.
9. Darlene Boniface also agreed with the proposed design. She noted the human impacts associated with Alternative 3-2-3. She specifically mentioned the displacement of the Augustinowicz family. D. Lyford expressed regret that it had happened. She asked if the potential sale of the Bellows Falls Dam will impact the project. D. Lyford stated that it would not. She also asked if any more homes will be taken along the River to support the project. D. Lyford stated that no other homes are proposed to be taken with the new design.
10. Michael Augustinowicz also agreed with the proposed design.

11. Patrick Kiniry also agreed with the proposed design. However, he requested that the Department also look at the riverbank slope just south of the project limits to verify that the project will not cause further erosion of the riverbank slopes. He noted that those properties have already lost 25-40 feet of riverbank due to erosion.
 12. Cheryl Mayberry also agreed with the proposed design. She noted that the armored slopes seem to provide a long term solution to the riverbank erosion in this area.
 13. Aare Ilves also agreed with the proposed design. However, he questioned the difference in the roadway offsets (for the southern segment) between the previous design and the new design. In the previous design, the roadway was moved out of the riverbank slope failure plane. In the new design, the riverbank slope is armored to prevent failure. He expressed concern that the new design would not prevent failure of the slope. S. Fifield explained that the armored slope would be engineered to prevent a failure plane. J. Bruno added that this would be accomplished by the weight of the stone, keying the stone into the bottom of the river and by drainage improvements at the top of the slope. Mr. Ilves asked when the project will be completed. P. Salo stated in the fall of 2019.
 14. Thomas Cobb also agreed with the proposed design
 15. Nate Miller also agreed with the proposed design.
- It was noted that the railroad siding will not be relocated as part of the 14747 project.
 - J. Evans reiterated that the Department is reopening the environmental review process. N. Miller asked if any "showstoppers" are apparent. J. Evans did not express concern that the reevaluation will net any issues that will hinder the design process.
 - N. Miller noted that the Planning Commissions have worked closely with the NHDOT on the Ten Year Plan (TYP), and that funding NH Route 12 improvements located to the north of this project have been added to the TYP.
 - D. Lyford noted that the Department would like to hold a Public Informational Meeting to inform the public of the new design. He targeted the end of May or early June 2016 for the meeting.

Submitted by:



Samantha D. Fifield, P.E.
Consultant Supervisor

SDF/sdf

NOTED BY: PES

cc: D. Lyford, File

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Project Advisory Committee Meeting

PROJECT: Walpole-Charlestown 14747

DATE: April 12, 2016

LOCATION: Charlestown, N.H.

NAME	ORGANIZATION	TELEPHONE	E-MAIL
PETER SALE	NH DOT	271-3461	psale@dot.state.nh.us
SAMANTHA FIELDS	NH DOT	271-1519	sfields@dot.state.nh.us
Jon Evans	NH DOT	271-4048	jevans@dot.state.nh.us
NATE MILLER	UVLRPC	448-1680	nmiller@uvlrpc.org
Dave Edkins	Town of Charlestown	826-5368	dledkins@charlestown-nh.gov
Don Lyford	NH DOT	871-2165	dlyford@dot.state.nh.us
John Bruno	Charlestown Resident Nwalpole Village Commission SURP TRC COMMITTEE-WALPOLE	445-2307	johnbruno70@gmail.com
Cheryl Mayberry		313-2599	cmayberry@sambd.org
Aave Ilves	Charlestown - Citizen North Walpole Village Commission	826-3126	aaveilves@comcast.net
PATRICK KINIRY		381-2385	kinirypatrick@hotmail.com
Charlie St. Pierre	Charlestown Resident	826-4121	
Sharon Trueman	Charlestown P.E. Bd	826-5865	

Project Advisory Committee Meeting

PROJECT: Walpole-Charlestown 14747

DATE: April 12, 2016

LOCATION: Charlestown, N.H.

NAME	ORGANIZATION	TELEPHONE	E-MAIL
Darlene Boniface		603 445-5604	dbonifac@comcast.net
Steven Neill	Charlestown Selectboard	603-826-1400	
Richard & Mary Holmes	CCC Hollisters	603 445-5209	
Jim McManus	CRJC	603-826-5214	M2kmanus@char-dcn
Michael Augustinovic			
Dexter Ward Holmes			S Charlestown
Thomas Cobb	Charlestown Selectboard		

Walpole – Charlestown 14747
Reconstruction of NH Route 12
PAC Meeting 4-12-16



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Existing Conditions and Need for the Project

- The existing pavement is 24 feet wide with no shoulders, pedestrians and bicyclists must use the roadway
- 50 MPH Design and Posted Speed Limit
- The 2013 Average Daily Traffic is 6320 vehicles
- Southern roadway embankments show signs of failure
- Pavement shows signs of deterioration
- Accident history associated with lack of shoulders, need for updated guardrail in some areas and appropriate safety zone between the roadway and river/railroad.
- Geometric Constraints (River, Railroad, NH Route 12A Bridge)
- Areas of substandard drainage

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NH Route 12



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Originally Proposed Design

- Alternatives Considered during the Design Process:
 - No Build
 - Western Alignment Shift (Alternative 2)
 - Eastern Alignment Shift (Alternative 3)
 - Eastern Bypass (Alternative 4)
 - Online Alignment with Retaining Walls (Alternative 5)
 - Hybrid, Northern Segment Westward Shift (Alt 3-2-2)
 - NH Route 12/12A Intersection Reconfiguration (Alt 3-2-2A & Alt 3-2-3A)
- Rationale used for the selection of Alternative 3-2-3
 - Avoids impacts to the river in the southern and northern segments
 - Avoids costly impacts to a steep slope located east of the railroad in the middle section
 - Avoids extensive impacts to surrounding properties
 - Estimated construction cost approximately \$15 million to \$20 million

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Design and Construction Challenges Associated with the Selected Alternative (3-2-3)

- Design Coordination with the Railroad
- Geotechnical Issues – Blasting next to active railroad (6 - 8 trains a day)
- Construction Phasing
- Mildly Contaminated Materials – Railroad Ballast
- Construction Schedule (min of 4 years)
- Cost - \$33 + Million (Department's Program cannot support the cost of this project as designed).



Proposed Design Constraints

- No impacts to the railroad tracks.
- No impacts to the NH Route 12A Bridge.
- No impacts to archaeological area No. 10.
- Minimize traffic impacts.
- Consider Utility relocations.



Features Investigated for the Proposed Design

- Design of an alignment that minimizes a westerly shift to the existing roadway alignment to an offset that is required for roadway reconstruction (without impacting the railroad tracks) and also allows for traffic control during construction.
- Minimize traffic impacts.
- Revised the proposed roadway profile to maintain existing railroad drainage.
- Construction Costs.
- Two riverside design features were investigated:
 - Armored Slopes with Surface Vegetation
 - Retaining Walls



Proposed Alternative Design

- Western Alignment Shift (Alternative 2)
- Minimizes impacts to the railroad (encroachment only), no impacts to the railroad tracks.
- Minimizes overall volume of blasting and the release of nitrates into the environment.
- Avoids a pre-split rock cut and tree clearing east of the railroad tracks.
- Minimizes the construction schedule (2 years).
- Eliminates impacts to the Fall Mountain State Forest.
- Minimizes construction costs.

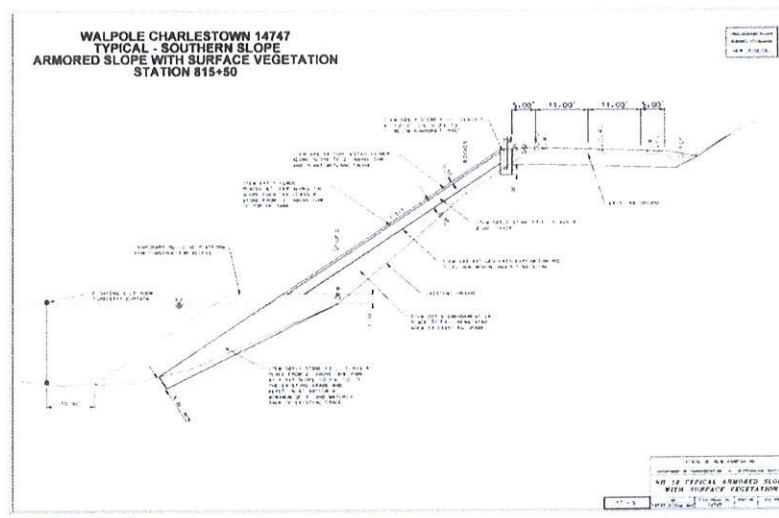


Construction Costs

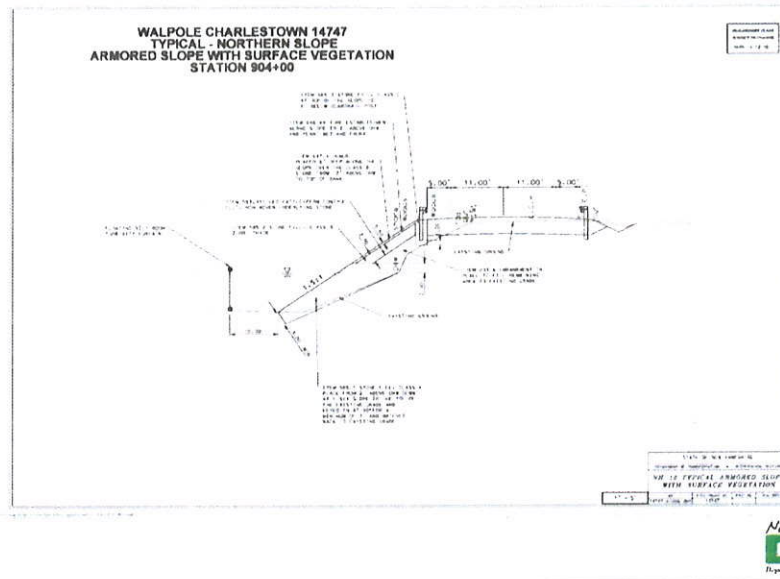
Estimated Construction Costs				
Southern Segment		Northern Segment		Estimated Total Project Cost
Alternative 3-2-3	\$22,696,000	Current Design	\$10,010,000	\$32,706,000
Alignment w/o Impacts to the RR (Retaining Wall)	\$15,610,000	Alignment w/o Impacts to the RR (Retaining Wall)	\$12,242,000	\$27,852,000
Alignment w/o Impacts to the RR (Armored Riverbank)	\$9,837,000	Alignment w/o Impacts to the RR (Armored Riverbank)	\$7,192,000	\$17,029,000



Proposed Armored Slopes with Surface Vegetation - Southern Typical



Proposed Armored Slopes with Surface Vegetation - Northern Typical



Advantages of Armored Slopes with Surface Vegetation.

- Can be designed to allow for quick reestablishment of the riparian buffer.
- Stabilizes the riverbank slope (southern segment) against failure.
- Provides more natural views from the Connecticut River.
- Provides habitat for wildlife.
- Prevents future impacts to the slopes for retaining wall maintenance and repair.
- Lowest estimated construction cost.

Example of Armored Slopes with Surface Vegetation



NH Route 63 –
Chesterfield
(Spofford Lake)



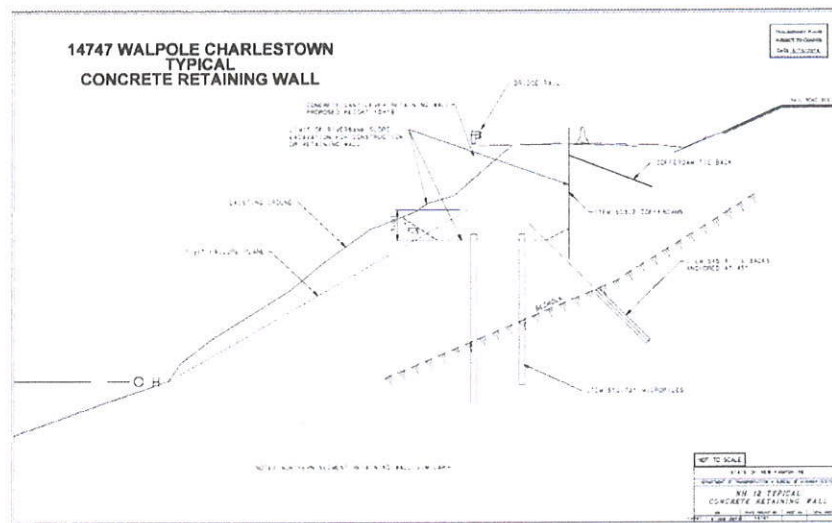
Example of Armored Slopes with Surface Vegetation



I-93 Southbound at Exit 2
South of Brookdale Road
in Salem, N.H.



Proposed Retaining Wall Typical



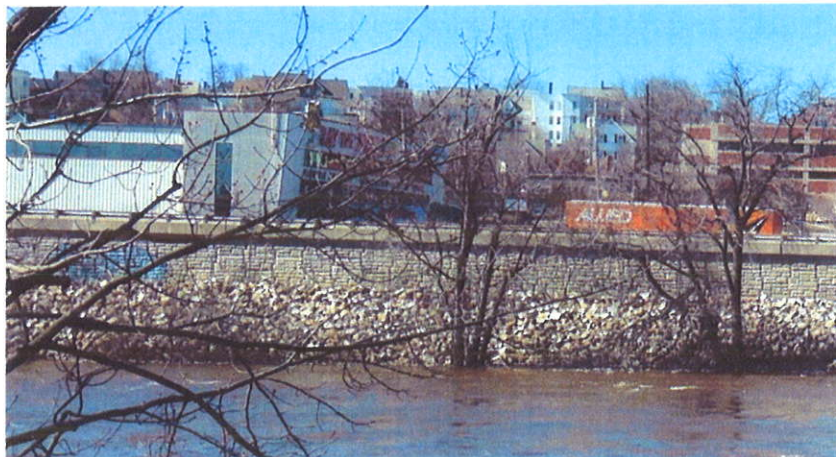
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Retaining Wall Disadvantages

- Greater duration for construction and impacts to traffic.
- Significant increase in construction cost compared to the armored slope with surface vegetation option.
- Potential failure of the existing 1:1 slope (southern segment) below the wall before, during and after construction.
- Need for future maintenance and replacement.
- Vandalism/graffiti.
- Prevents wildlife passage.
- Aesthetics.

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Example of Retaining Wall



I-293 – Manchester (Merrimack River)



Recommendation: Armored Slope with Surface Vegetation Design

- Stabilizes the Existing Riverbank Slopes
- Eliminates Future Impacts to the Riverbank Slopes due to Retaining Wall Maintenance/Repair
- Balances Environmental Impacts
- Minimizes Impacts to the Traveling Public
- Minimizes Construction Duration
- Minimizes Costs (\$10 + Million less than Retaining Wall Option)



Preliminary Permanent Impacts for Proposed Armored Slope with Surface Vegetation Design

- 2.5 AC of ACOE jurisdictional wetland impacts
- 3.4 AC of NHDES jurisdictional bank impacts
- Increase of 2.4 AC of impervious area due to proposed paved shoulders (same for all options).
- A Hydrologic and Hydraulic study is required. Impacts are anticipated to be negligible.